Volunteer Lake Assessment Program Individual Lake Reports
CLEMENT POND, HOPKINTON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	1,530	Max. Depth (m):	15.5	Flushing Rate (yr[1])	0.9	
Surface Area (Ac.):	119	Mean Depth (m):	6.6	P Retention Coef:	0.63	
Shore Length (m):	3,200	Volume (m³):	3,153,500	Elevation (ft):	417	

TROPHIC CLASSIFICATION

Year	Trophic class
1979	EUTROPHIC
1990	MESOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator and the chlorophyll a indicator is okay.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Chlorophyll-a	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

CLEMENT POND - CAMP MERRIMAC BEACH	Escherichia coli	Good	There are geometric means and all geometric means are < geometric mean criteria; and there has been a single sample exceedance.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.
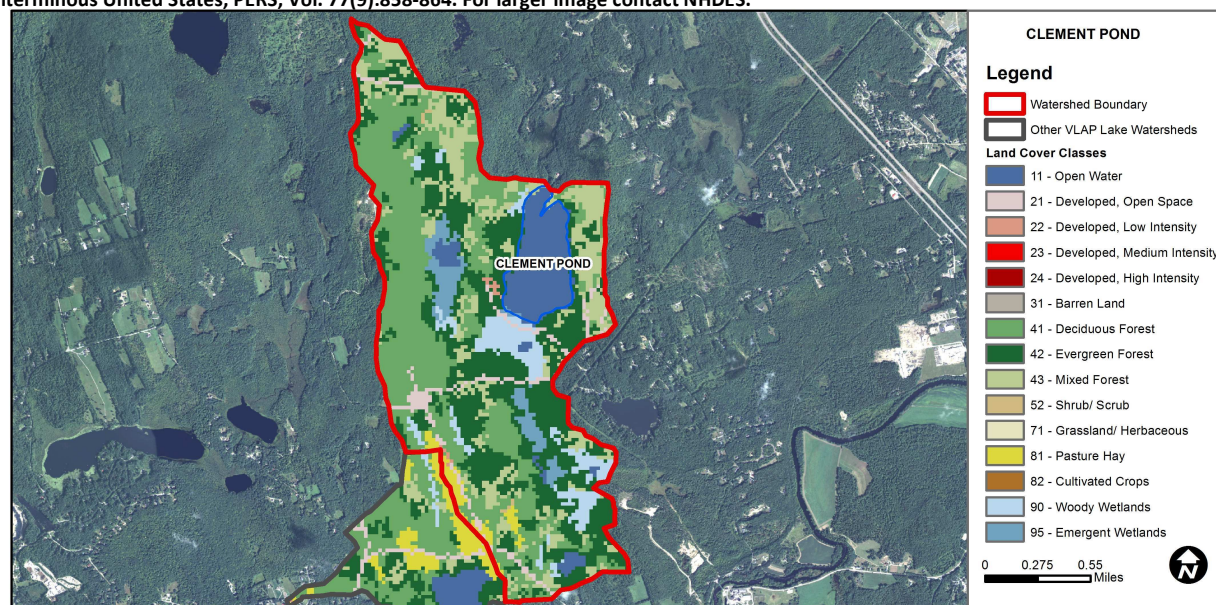
| Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	8.73	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	3.14	Deciduous Forest	30.71	Pasture Hay	1.68
Developed-Low Intensity	0.25	Evergreen Forest	30.05	Cultivated Crops	0
Developed-Medium Intensity	0	Mixed Forest	15.8	Woody Wetlands	6.1
Developed-High Intensity	0	Shrub-Scrub	0.14	Emergent Wetlands	3.48

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics*)

- **CHLOROPHYLL-A:** Chlorophyll levels were low in June, increased slightly in July, and then decreased back to low levels in August. Average chlorophyll was less than the state median and decreased from higher levels measured in 2012 and 2013. Historical trend analysis indicates highly variable chlorophyll levels since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Deep spot and tributary conductivity and chloride levels were low and approximately equal to the state medians. Historical trend analysis indicates stable epilimnetic (upper water layer) conductivity since monitoring began which is a great sign!
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels remained low from June through August. Average epilimnetic phosphorus levels were much less than the state median and the lowest measured since monitoring began. Historical trend analysis indicates stable epilimnetic phosphorus since monitoring began. Metalimnetic (middle water layer) phosphorus was low in June and July and elevated in August potentially due to a layer of algae at that depth. Hypolimnetic (lower water layer) phosphorus increased steadily from June to August however remained within a low to average range. Inlet phosphorus was average in June and August, but slightly elevated in July and lab data note clumps of organic material in the sample. Outlet phosphorus was low on each sampling event.
- **TRANSPARENCY:** Transparency measured without the viewscope (NVS) was good in June, decreased (worsened) in July, and then increased (improved) in August. The low July clarity was likely due to difficulty viewing the Secchi disk due to small waves at the water's surface as the viewscope clarity measurement on the same day was much better and likely representative of actual conditions. Historical trend analysis indicates stable transparency since monitoring began.
- **TURBIDITY:** Epilimnetic turbidity increased slightly from June to July potentially due to the increased algal growth, and then decreased from July to August. Metalimnetic turbidity was elevated in August likely due to a layer of algae at that depth. Hypolimnetic turbidity was low in June and July and increased slightly in August but was within the historical average for that station. Hopkinton Inlet turbidity was elevated in July due to organic matter in the sample. Outlet turbidity was low on each sampling event.
- **PH:** Epilimnetic pH was within the desirable range of 6.5—8.0 units, however historical trend analysis indicates significantly decreasing (worsening) epilimnetic pH since monitoring began. Metalimnetic and hypolimnetic pH tend to fall below the desirable range as the summer progresses. Hopkinton Inlet pH is slightly lower than desirable likely due to wetland influences. Outlet pH is within a good range.
- **RECOMMENDED ACTIONS:** Pond water quality improved slightly in 2014 which is good. The 2014 summer received less rainfall than 2013 which likely helped to improve water quality. Shorefront and watershed property owners should try to minimize the impacts of stormwater runoff from their properties as it would likely help improve water quality. DES' "NH Homeowner's Guide to Stormwater Management" is a great resource. Keep up the great work!

Dissolved Oxygen & Temp Profile June, 2014
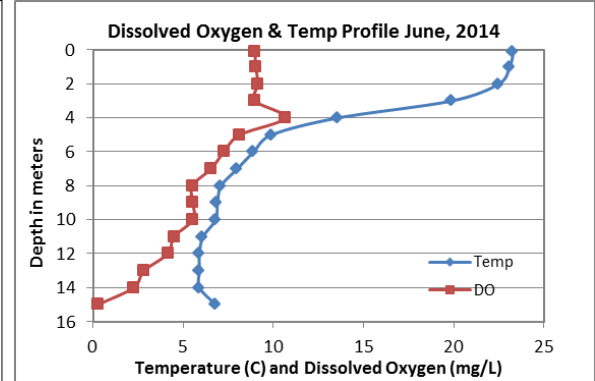
NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.

Chloride: > 230 mg/L (chronic)

E. coli: > 88 cts/100 mL – public beach

E. coli: > 406 cts/100 mL – surface waters

Turbidity: > 10 NTU above natural level

pH: between 6.5-8.0 (unless naturally occurring)

Station Name	Table 1. 2014 Average Water Quality Data for CLEMENT POND								
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	9.03	3.41	5	44.0	7	3.48	4.51	0.93	6.94
Metalimnion				45.6	12			1.20	6.30
Hypolimnion				50.6	11			1.00	6.26
Hardy Brook Outlet			5	44.3	8			0.63	7.01
Hopkinton Inlet			7	54.7	16			1.28	6.31

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.

Alkalinity: 4.9 mg/L

Chlorophyll-a: 4.58 mg/m^3

Conductivity: 40.0 uS/cm

Chloride: 4 mg/L

Total Phosphorus: 12 ug/L

Transparency: 3.2 m

pH: 6.6

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Stable	Trend not significant; data show low variability.	Chlorophyll-a	Stable	Trend not significant; data highly variable.
pH (epilimnion)	Worsening	Data significantly decreasing.	Transparency	Stable	Trend not significant; data show low variability.
			Phosphorus (epilimnion)	Stable	Trend not significant; data show low variability.

Historical Trend Epilimnetic Conductivity and pH

Historical Deep Spot
Chlorophyll-a, Epilimnetic Total Phosphorus & Transparency Data